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at the lower limit; the part remaining to be integrated is simplified by means of the identity (2)),

hence
$$\int_0^{2\pi}\rho\cos 2\theta d\theta = 2\int_0^{2\pi}\rho\cos^2\theta d\theta - \int_0^{2\pi}\rho d\theta$$
$$= n_1\left(1 - \frac{1-e^{-h^2v_1^2}}{h^2v_1^2}\right).$$

(3) The integral $\int_0^{2\pi}\rho\cos 3\theta d\theta$, and corresponding integrals for any odd multiples of θ, can be found by a simple extension of the method employed for $\int_0^{2\pi}\rho\cos\theta d\theta$. The integrals for even multiples of θ are more troublesome to evaluate, but the method employed for $\int_0^{2\pi}\rho\cos 2\theta d\theta$ always succeeds.

Tables of the two hypergeometrical functions, F$\left(1/6, 5/6, 2, \sin^2\frac{\iota}{2}\right)$ *and* F$\left(-1/6, 7/6, 2, \sin^2\frac{\iota}{2}\right)$, *between the limits iota equals* 90 *and* 180 *degrees.* By C. J. Merfield.

In the method of Mr. R. T. A. Innes for the determination of the secular perturbations,* there are two hypergeometrical functions to be deduced. In an appendix † to this valuable paper, tables of the logarithms of these functions are given with the argument iota for each degree ‡ for the first quadrant.

Tables of these functions facilitate the application of this method in no small degree, and it seemed desirable to extend them, as in many future investigations it will be found that the angle iota will much exceed a quadrant. Taking an example, Eros §—Earth, it will be noted that the modular angle theta, the argument to the tables of elliptical integrals, reaches the value 60°, corresponding to iota 138° 18′, and there will be many other cases in which it exceeds this value.

In the preparation of the tables here given the formulæ ‖ (*l.c.*,

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* "Computation of Secular Perturbations," by R. T. A. Innes, *Monthly Notices*, vol. lxvii. 427.

† Tables for the application of Mr. Innes's Method, by Frank Robbins. *l.c.*, 444.

‡ The values of these functions for iota equals 0° have been omitted in the tabulation by Mr. Robbins.

§ "Secular Perturbations of Eros," by C. J. Merfield, *Astr. Nachr.*, 4178–79, Band 175.

‖ The values of these functions may be deduced from series. I have given the coefficients of twenty terms, *Astr. Nachr.*, 4215, Band 176, p. 246.

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442) of Mr. Innes have been adopted. Seven-figure logarithms have been used, and the *Additions- und Subtractions-Logarithmen* by Zech where necessary, but the powers of the trigonometrical ratios have been formed from the values of these functions tabulated in Vega's ten-figure table, and the results used to seven figures.

Taking

$$\iota_1 = 180 - \iota$$

then

$$\cos\frac{\iota_1}{2} = \sin\frac{\iota}{2}$$

and the following relation holds,

$$F\left(-1/6\ \ldots\ \sin^2\frac{\iota}{2}\right)\ F\left(1/6\ \ldots\ .\ \sin^2\frac{\iota_1}{2}\right) +$$

$$F\left(1/6\ \ldots\ .\ \sin^2\frac{\iota}{2}\right)\ F\left(-1/6\ \ldots\ \sin^2\frac{\iota_1}{2}\right) = 216/35\pi.$$

The logarithm of the right-hand member equals 0·29323583 . . . . Writing in this formula the quantities taken from the tables, then it will generally be found that the residual does not exceed a unit in the seventh decimal place of the logarithm in any portion of the tables. This formula might have been used in calculating either function after one of them had been deduced between the limits 90 and 180 degrees, combined with the values tabulated by Mr. Robbins, *loco citato*.

Sydney:
1908 *February* 10.

TABLES.

ι	Log F (1/6 . . . .)	Δ_1	Δ_2	Log F (−1/6 . . . .)	Δ_1	Δ_2
90°	0·0183800	+3991	+41	9·9738258	−5778	−62
91	0·0187832	4032	40	9·9732418	5840	62
92	0·0191904	4072	38	9·9726516	5902	62
93	0·0196014	4110	39	9·9720552	5964	61
94	0·0200163	4149	39	9·9714527	6025	61
95	0·0204351	4188	38	9·9708441	6086	60
96	0·0208577	4226	39	9·9702295	6146	62
97	0·0212842	4265	38	9·9696087	6208	60
98	0·0217145	4303	39	9·9689819	6268	60
99	0·0221487	4342	37	9·9683491	6328	59
100	0·0225866	4379	+37	9·9677104	6387	−60
		+4416			−6447	

ι	Log F (1/6 . . . .)	Δ1	Δ2	Log F (−1/6 . . . .)	Δ1	Δ2
		+4416			−6447	
101	0·0230282		+36	9·9670657		−58
		4452			6505	
102	0·0234734		36	9·9664152		58
		4488			6563	
103	0·0239222		35	9·9657589		57
		4523			6620	
104	0·0243745		36	9·9650969		58
		4559			6678	
105	0·0248304		34	9·9644291		56
		4593			6734	
106	0·0252897		34	9·9637557		56
		4627			6790	
107	0·0257524		35	9·9630767		55
		4662			6845	
108	0·0262186		34	9·9623922		56
		4696			6901	
109	0·0266882		33	9·9617021		54
		4729			6955	
110	0·0271611		33	9·9610066		53
		4762			7008	
111	0·0276373		31	9·9603058		53
		4793			7061	
112	0·0281166		32	9·9595997		52
		4825			7113	
113	0·0285991		31	9·9588884		52
		4856			7165	
114	0·0290847		30	9·9581719		50
		4886			7215	
115	0·0295733		28	9·9574504		48
		4914			7263	
116	0·0300647		29	9·9567241		49
		4943			7312	
117	0·0305590		29	9·9559929		48
		4972			7360	
118	0·0310562		27	9·9552569		45
		4999			7405	
119	0·0315561		26	9·9545164		46
		5025			7451	
120	0·0320586		26	9·9537713		44
		5051			7495	
121	0·0325637		24	9·9530218		44
		5075			7539	
122	0·0330712		24	9·9522679		41
		5099			7580	
123	0·0335811		22	9·9515099		41
		5121			7621	
124	0·0340932		23	9·9507478		39
		5144			7660	
125	0·0346076		21	9·9499818		37
		5165			7697	
126	0·0351241		20	9·9492121		36
		5185			7733	
127	0·0356426		19	9·9484388		34
		5204			7767	
128	0·0361630		18	9·9476621		33
		5222			7800	
129	0·0366852		16	9·9468821		30
		5238			7830	
130	0·0372090		15	9·9460991		29
		5253			7859	
131	0·0377343		13	9·9453132		26
		5266			7885	
132	0·0382609		13	9·9445247		25
		5279			7910	
133	0·0387888		11	9·9437337		24
		5290			7934	
134	0·0393178		10	9·9429403		20
		5300			7954	
135	0·0398478		7	9·9421449		17
		5307			7971	
136	0·0403785		7	9·9413478		15
		5314			7986	
137	0·0409099		5	9·9405492		13
		5319			7999	
138	0·0414418		+4	9·9397493		9
		5323			8008	
139	0·0419741		0	9·9389485		7
		5323			8015	
140	0·0425064		−1	9·9381470		−3
		+5322			−8018	

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ι	Log F (1/6 . . . .)	Δ1	Δ2	Log F (−1/6 . . . .)	Δ1	Δ2
141	0·0430386	+5322	−4	9·9373452	−8018	0
142	0·0435704	5318	5	9·9365434	8018	+4
143	0·0441017	5313	8	9·9357420	8014	6
144	0·0446322	5305	10	9·9349412	8008	11
145	0·0451617	5295	12	9·9341415	7997	14
146	0·0456900	5283	16	9·9333432	7983	20
147	0·0462167	5267	19	9·9325469	7963	25
148	0·0467415	5248	21	9·9317531	7938	30
149	0·0472642	5227	25	9·9309623	7908	34
150	0·0477844	5202	28	9·9301749	7874	40
151	0·0483018	5174	31	9·9293915	7834	45
152	0·0488161	5143	35	9·9286126	7789	52
153	0·0493269	5108	40	9·9278389	7737	55
154	0·0498337	5068	43	9·9270707	7682	65
155	0·0503362	5025	48	9·9263090	7617	73
156	0·0508339	4977	52	9·9255546	7544	79
157	0·0513264	4925	58	9·9248081	7465	89
158	0·0518131	4867	64	9·9240705	7376	96
159	0·0522934	4803	68	9·9233425	7280	107
160	0·0527669	4735	76	9·9226252	7173	116
161	0·0532328	4659	83	9·9219195	7057	128
162	0·0536904	4576	89	9·9212266	6929	137
163	0·0541391	4487	98	9·9205474	6792	151
164	0·0545780	4389	106	9·9198833	6641	165
165	0·0550063	4283	115	9·9192357	6476	180
166	0·0554231	4168	126	9·9186061	6296	194
167	0·0558273	4042	136	9·9179959	6102	211
168	0·0562179	3906	148	9·9174068	5891	231
169	0·0565937	3758	163	9·9168408	5660	253
170	0·0569532	3595	177	9·9163001	5407	274
171	0·0572950	3418	194	9·9157868	5133	300
172	0·0576174	3224	213	9·9153035	4833	331
173	0·0579185	3011	238	9·9148533	4502	362
174	0·0581958	2773	263	9·9144393	4140	403
175	0·0584468	2510	294	9·9140656	3737	448
176	0·0586684	2216	334	9·9137367	3289	507
177	0·0588566	1882	385	9·9134585	2782	581
178	0·0590063	1497	462	9·9132384	2201	687
179	0·0591098	1035	−607	9·9130870	1514	+890
180	0·0591526	+428		9·9130246	−624	

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Further Note on the Position of the Sun's Axis of Rotation, as deduced from Greenwich Sun-spot Measures 1874–1885. *Papers of the I.U.S.R. Computing Bureau, No. II.* By H. H. Turner, D.Sc., F.R.S., Savilian Professor.

1. This note gives for the period 1874–1885 computations similar to those given for the period 1886–1901 in the December No. (p. 98). The discussion is limited to spot-groups which live for ten days. The tables are numbered to correspond with those of the former note.

TABLE I.

Latitude drift between +65° *and* −65° *in each month* (*of the years* 1874–1885).

Latitude.	−25°	−20°	−15°	−10°	0°	+10°	+15°	+20°	+25°	
Jan.	+57	+170	−64	−19	−33	+25	00	−21	—	+5
Feb.	+113	−41	−48	−61	+62	−29	+50	−16	+77	+70
Mar.	−27	+145	+15	+45	+16	+30	+80	+97	—	—
Apr.	−55	+100	+79	+23	+34	+55	+113	+61	+118	—
May	−85	—	+12	+39	+45	+5	+62	−22	+10	+5
June	—	−171	+43	+31	−50	+70	−61	+125	+73	+125
July	−23	—	−33	−97	−18	+5	−52	−116	−2	+115
Aug.	—	+15	+35	+28	+17	−34	+27	+23	+57	−5
Sept.	+35	−90	−11	−136	+8	+31	−55	+11	+38	0
Oct.	—	−13	+18	+57	−38	−53	−4	+46	+53	—
Nov.	—	−37	+60	+12	−11	−17	−52	−7	−83	—
Dec.	−75	—	+62	+240	−25	+33	−80	−54	−1	+215
Mean	—	—	+14	+14	+1	+10	+2	+11	—	—

The unit in the tables is 0°·01, and the figures are, in Table I., differences between the mean residual at +65° and −65° in

TABLE II.

Latitude drift between +35° *and* −35° *in each month* (*of the years* 1874–1885).

Latitude.	−25°	−20°	−15°	−10°	0°	+10°	+15°	+20°	+25°	
Jan.	+48	+95	+25	+12	−37	+25	−29	−53	—	+15
Feb.	+50	−6	−51	−30	+20	+23	+3	−5	+40	+152
Mar.	+32	+71	−6	+32	+23	+39	+70	−2	—	—
Apr.	−35	+80	+49	+12	−1	+7	+33	+10	+98	—
May	−87	+10	+24	+31	+36	−31	+31	+68	+50	+88
June	+12	−70	+10	+34	+61	+60	−23	+75	+43	+135
July	+51	−88	−1	−16	+25	−10	−10	−38	+12	+87
Aug.	—	+47	+15	−26	+10	−63	+6	+90	+8	+15
Sept.	+2	−6	−24	−87	+26	−4	+3	+8	+41	+12
Oct.	—	+5	+9	+25	+4	−25	−15	+5	+10	—
Nov.	—	−43	+74	+17	−1	−67	−15	+2	−58	—
Dec.	−15	—	+43	+137	+30	+59	−88	−194	+22	+67
Mean	—	—	+14	+12	+16	+1	−3	−3	—	—